8. COMMUNITY: Services & Facilities

OVERVIEW

This section summarizes the existing conditions of the services and facilities in the Town of Amherst. Historical data and facility reports have been reviewed to assess the current status of the utilities and their ability to meet the needs of the community and the Town's Master Plan. The *Sewer Extension Plan Draft Report (CDM 2004)* and *Facility Plan Update Water Supply and Distribution System (Tighe&Bond 2001)* provided information to aid in the assessment of the existing water and sewer systems. The assessment of the Amherst Public Schools existing conditions was prepared by utilizing the *Amherst School Facility Audit (CID Associates Inc)*. Annual Town Reports, Town Geographic Information System (GIS) data, and discussions with Public Works officials were used to determine the drainage and street light conditions, proposed improvements and future needs.

After this overview section, the document is organized into the following sections:

- **Key Findings** – The key findings represent a summary of important conclusions drawn by the consulting team.
- **Detailed Information** – This section includes the background documentation for the key findings. It is divided into ten parts:
  - A. Water System

- B. Wastewater Collection and Treatment
- C. Stormwater and Drainage
- D. Street Lights
- E. Capacity for Future Growth.
- F. School System
- G. Public Safety
- H. Libraries
- I. Town Services
- J. Utility Master Plan Considerations

Development of utility master plans and capital improvement plans are significant undertakings, requiring extensive data collection, field studies, engineering analysis and evaluation of alternatives. As discussed above, existing reports and data have been relied upon to develop the key findings and information for the utility portion of the Town-wide master plan.

In general, the primary issues affecting utility planning are:

- Capacity and infrastructure required for expansion;
- Replacement/repairs to aging infrastructure;
- Infrastructure security;
- New regulatory requirements;
- Minimizing impacts on natural resources; and
- Implementing sustainability and "green" concepts to public utilities.

These issues will be considered when looking at the role of the Department of Public Works (DPW) (which handles water, wastewater, stormwater/drainage, and street lighting utilities) as part of the Town Master Plan. However, specific capital improvements, costs, and schedules have not been developed.

KEY FINDINGS

A. **Water:** The Town has an extensive water system with multiple water supply sources, both groundwater and surface water. The water supplies and treatment plants meet federal and state water quality requirements and provide the public with safe and reliable drinking water and fire protection. Key findings include:

- The water system serves 6,369 customers with a service population of 38,000, with 41 percent of water used by the University and colleges.
- The water usage has remained relatively constant for the past ten years, primarily due to water conservation efforts by the Town and UMass.
- The Town currently has sufficient water supply but will need to identify and begin development of a new groundwater supply to meet anticipated future demands and improve reliability.

- The Water Department has a Capital Improvement Plan (CIP) to address replacement of aging infrastructure.

B. **Wastewater:** The Town of Amherst owns and operates a municipal wastewater collection system and treatment plant. The wastewater collection system consists of interceptor sewers, lateral sewers, wastewater pumping stations and force mains. There is a single wastewater treatment facility providing secondary treatment of wastewater. Key findings include:
   - The wastewater treatment plant is in very good condition and has approximately 2.5 to 3.0 million gallons per day (mgd) of excess capacity.
   - Approximately 120 gallons per minute (gpm) (0.17 mgd) of wastewater effluent is treated and reused for cooling water at the new UMass power plant. The expected savings is approximately 44 million gallons (Mg) per year. Additional uses are anticipated in the future.
   - The 2004 Sewer Extension Master Plan evaluated needs, analyzed centralized vs. local alternatives, and identified priorities for the 12 unsewered "sub areas" in the Town. Of the 12 areas, none were determined to have a major need and 4 were determined to have a moderate need.
   - The Treatment Plant Staff has a sewer system maintenance and repair program to reduce inflow/infiltration in the system.

C. **Drainage/Stormwater:** Stormwater in the Town of Amherst is collected through a combination of swales, drainage ditches, culverts, catch basins and piped collection systems. Additionally, in more recent projects, there are some stormwater treatment systems. Key findings include:
   - The DPW-Highway Department maintains and manages the drainage system in the Town, which includes street sweeping, catch basin cleaning and drainage ditch maintenance.
   - New stormwater collection and treatment systems are typically constructed by developers as part of new development. If and when the Town accepts these streets, the DPW assumes maintenance responsibility.
   - The Town is currently exempt from the EPA Phase II Stormwater Requirements; however, the DPW is currently implementing many of these requirements.

D. **Street Lighting:** The Town of Amherst purchased the street lighting in the Town from Western Massachusetts Electric. The DPW maintains the street light system and has a plan to upgrade the lighting system to be more energy efficient and implement "Dark Sky" concepts to reduce

light pollution. Currently about 20 percent of the street lights have been upgraded.

E. **Capacity for Future Growth:** The utility systems in the Town have been well planned and provide the basic infrastructure for growth. The water and wastewater systems are regulated utilities with specific capacities based on available resources, permits and supply/treatment process, while stormwater is generally a localized utility and street lighting is part of a large grid. Key findings regarding the capacity of the utility infrastructure are as follows:
   - The water system has a total capacity of 6.64 mgd and a reliable capacity of 4.34 mgd. Projected 2020 maximum day demands (5.66 mgd) cannot be met without water conservation.
   - The Town should identify potential new supply sites and preserve them for future implementation.
   - Extensions of the water distribution system will depend upon the specific requirements of the area including required flows, pressures and fire protection.
   - The Town should encourage water conservation and water reuse to reduce demands.
   - The wastewater treatment plant has sufficient capacity (7.1 mgd) to meet future projected flows (5.0 mgd).

F. **School System:** The Amherst Regional Public Schools provides education and special education services for students in pre-kindergarten through the twelfth grade. The school system consists of the following three districts; Amherst, Pelham, and Regional School Districts. The Amherst District serves students of Amherst in four community elementary schools (Crocker Farm, Fort River, Mark's Meadows, and Wildwood) and the Pelham District serves the students of Pelham at one elementary school. The Regional District serves the students of Amherst and Pelham, as well as Leverett and Shutesbury in one middle school (grades 7-8) and one high school (grades 9 – 12). The districts office is located in the middle school at 170 Chestnut St. Key findings are as follows:
   - The Amherst Middle School experiences an abundance of traffic flow throughout the day and throughout the year. Many of the central offices, public meetings and summer camps are held at the school site.
   - The University's ownership of Crocker Elementary School creates barrier to renovating the building which is in disrepair.
   - The school provides a number of services to children of special needs, but requires a larger building footprint to hold classrooms for these children.

- All of the schools in the system are either at or above the current classroom capacity.

G. **Public Safety**
- Based on interviews with both fire and police chief, it is evident that an increase of funding is required to increase the staffing levels.
- The Amherst Fire Station Study Committee has been formed to assess the options of building a new fire sub station. The *Fire Station Site & Building Assessment Work* has been prepared by Caolo & Bieniek Associates, Inc.

H. **Library Services**
- Amherst contains three public libraries, each in a geographic location that is convenient to the residents of northern, southern and downtown Amherst.
- Current funding and budget cuts have caused a decrease in the libraries hours and staffing.

I. **Town Services**
- The Amherst Town Hall, Bangs Community Center and Public Works Building offer a multitude of services to the Amherst community.

DETAILED INFORMATION

This part of the chapter is broken down into six subsections and provides explanation for the key findings listed above.

Water System

System and Sources

The Amherst water distribution system is comprised of approximately 130 miles of water main, ranging in sizes from 2 to 16 inches in diameter. The pipe material consists of transite, ductile iron, cast iron, and polyvinyl chloride (PVC). The water system provides water for the majority of the Town. The only areas that are not served include the most northern and northeastern portions of the Town.

The Town is supplied by seven water sources, two of which are surface water and five that are groundwater wells. These sources are as follows:
- Surface Water: Atkins Reservoir and Pelham Reservoir; and
- Groundwater Wells: South Amherst Wells (#1 and #2), the Brown Well (#3), the Lawrence Swamp Well (#4), and the Bay Road Well (#5).

Atkins and Pelham, and Wells # 1, 2, and 3 are used year round, providing approximately 90 percent of the total water produced. Wells #4 and #5 are used during high demand periods.

Water Treatment

Amherst has three water treatment plants. The Centennial and Atkins water treatment plants treat the Pelham Reservoir and Atkins Reservoir, respectively. These treatments plants must follow the Surface Water Treatment Rule and Interim Enhanced Surface Water Treatment Rule and all related Safe Drinking Water Act (SDWA) requirements. These rules are based on the assumption that waterborn pathogens, such as Giardia, Cryptosporidium, etc., are present in all surface water sources. Since organic particles in water are the main carrier for pathogens, the rule requires turbity levels to be below 1.0 nephelometer turbidity units (NTU). Amherst's treatment plants meet the requirement by filtration to remove turbidity, and the use of chlorine, ozone, and ammonia for disinfection.

Baby Carriage Brook Water Treatment Filtration Plant treats the Well # 4 groundwater source. Therefore, the plant does not need to comply with the surface water treatment rules listed above. The plant uses the addition of potassium permanganate followed by filtration for iron and manganese removal.

As required by the SDWA, the Town of Amherst completes an annual Water Quality Report. Based on the 2006 report, the water supplies meet all the SDWA water quality requirements.

Table 8.1 summarizes surface water treatment plant efficiency for the past three years.

Table 8.1: Treatment Effeciency

Samples taken every 4 hours	**Annual Average Turbidity (NTU)**					
	Raw Water			**Treated Water**		
Treatment Plant	**2004**	**2005**	**2006**	**2004**	**2005**	**2006**
Centennial	0.52	0.5	0.30	0.1	0.08	0.07
Atkins	0.37	0.49	0.43	0.1	0.1	0.11

Source: Annual Water Quality Reports

The capacity of the water supply is critical when planning water system needs and improvements. Depending on the type of supply (surface water or groundwater), the capacity of the treatment and pumping facilities, and the DEP withdrawal permits, the reliable supply capacity can be determined. Based on the 2001 Tighe & Bond report, the capacities of the groundwater and surface water supplies are as shown in Table 8.2.

Table 8.2: Existing Supply Capacity

	Full-Time Rated Firm Yield (MGD)	"New Condition" Peak Output and/or Backup Supply Rated Capacity (MGD)	Reliable Operating Condition Capacity[2]
Atkins Res. WTP	1.25	1.25	1.25
Pelham Res. WTP	0.90	0.90	0.90
South Amherst Wells 1 & 2[1]	1.01	0.85[3]	0.72
Brown Well 3[1]	1.48	1.22	1.04
Lawrence Swamp Well 4[1]	1.74	1.50	1.28
Bay Road Well 5	0.50	0.50	0.43
Total All Supplies On-Line	6.64	6.22	5.62
Less Largest Supply Source	--	1.50	1.28
Reliable Capacity with Largest Supply Off-Line		4.72	4.34

Source: Tighe & Bond Facility Plan Update - Water Supply & Distribution System, March 2001

(1) Subject to well pump condition which historically decreases in capacity with time.

(2) Historically, each well pump experiences reduced pumping capacity with time as the pump components wear with use. For planning purposes, 85 percent of new condition capacity is considered a reasonalbe estimate of conditions which may be experienced between pump rehabilitation or replacement.

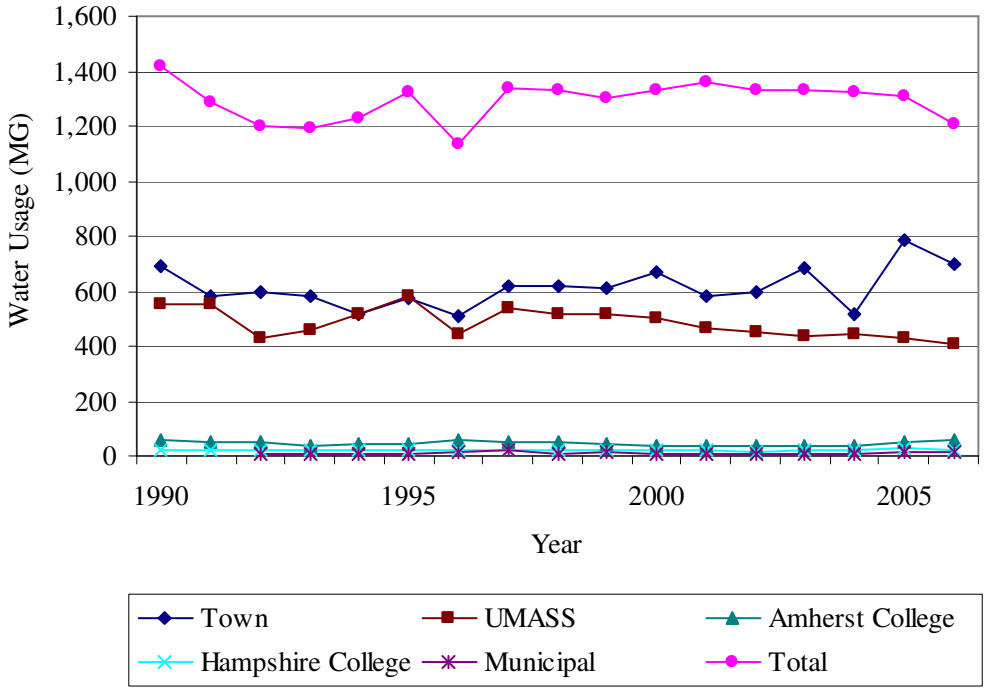
(3) Historically, Wells 1 & 2 are not capable of producing their full-time rated firm yield when Well 4 is in operation or during drought conditions.

Water Usage and Trends

After the Town, UMass is a primary user of the annual water pumped. Amherst College and Hampshire College uses are minimal in comparison, with municipal usage even lower. For the year 2006, the Town used 60 percent of the water pumped, with UMass using 34 percent. Amherst College, Hampshire College, and the municipality used 5 percent, 2 percent, and 1 percent of the water produced, respectively.

A historical water usage graph for the past fifteen years is shown in Chart 8.3. When examining the graph, the total water usage fluctuates. For the years 1990 through 1993, the water usage decreases, with a sharp increase in 1995, sharp decrease in 1996, and another noticeable increase in 1997. It is important to note that there was a drought in 1997. For the years 1997 through 2006, the overall pattern of water usage is a decending one. This holds true for the UMASS water usage, with a noticeable water usage drop in 2006. This drop is a result of a water conservation program implemented by UMass.

CHART 8.3: HISTORICAL WATER USAGE

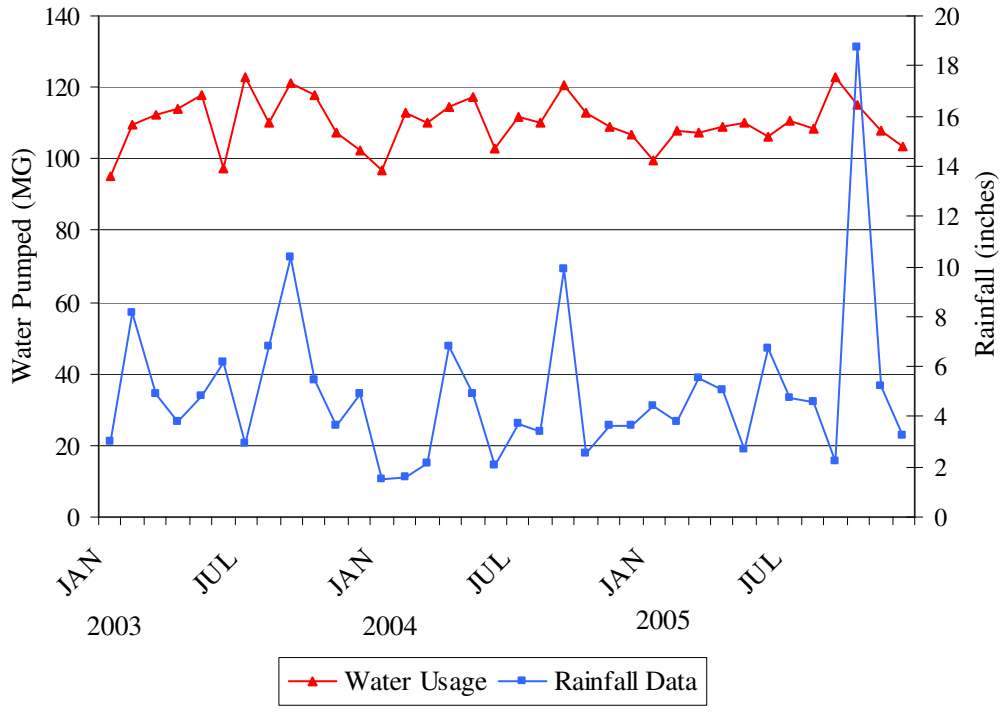


Source: Tighe & Bond Facility Plan Update Water Supply & Distribution System, March 2001, DEP Town Annual Statistical Reports

It is typical for water usage to fluctuate from year to year. Unaccounted for water affects the water usage for a particular year. As specified by the Massachusetts Department of Environmental Protection, an acceptable range for unaccounted for water is between 10 and 15 percent. In the past five years, unaccounted for water has exceeded 15 percent on two occasions – once in 2002 at 16.6 percent and again in 2004 at 19.8 percent. In 2005, a leak detection survey was conducted. Six leaks were identified and repaired. It is recommended that a leak detection survey be conducted every two years. The Water Department currently has a leak detection survey scheduled for August 2007.

It is also important to evaluate the historical monthly flow. Since Amherst is a town with three colleges, the population decreases during the months school is not in session. The monthly flow can also be paired with the rainfall to determine the effect a rain event has on the water pumped. Figure 8.4 displays this trend.

FIGURE 8.4: HISTORICAL MONTLY WATER USAGE



Source: Public Water Supply Annual Statistical Reports 2003 – 2004

As one would expect, a common trend for months with significant rainfall is a lower amount of water pumped. This trend is influenced by the use of water for irrigation of the college campuses and athletic fields. It is also evident that water production spikes during late August and early September, and drops during January and May. This correlates with the University and College Calendar.

Water Storage

There are four water storage tanks located in the Town. The South Amherst Tank, located off Bay Road, and three additional tanks located along East Pleasant Street. The current storage capacity is 4.65 MG. The tanks details are summarized in the table below:

Table 8.5: Water Storage Tanks

Water Storage Tanks				
Tank Name	Capacity (MG)	Diameter (FT)	Height (FT)	Overflow Elev. (FT)
Bay Road	1.00	65	40	470
East Pleasant St.	0.475	35	66	471
Univ. of Mass.	1.50	62	66	471
Village Park	1.68	78	47	471

Source: Facility Plan Update Water Supply and Distribution System (2001)

The 2001 Tighe & Bond Facility Plan Update identifies the storage tanks as not providing proper water circulation. This can result in water degradation.

Water Conservation

A water conservation plan is an important element to a town's water system. Annually, Amherst holds a water conservation education session at the Hitchcock Center for students in grades 2, 4 and 5.

Conservation of water is focused on the water useage created by the University and Colleges, in regards to water fixtures and irrigation practices. Recent fixture implementations include low flow shower heads, faucet aerators, replacement of "flushometer" on urinals and water closest with new low flow units, front loading washers, etc.

Conservation of the water used for the campuses and althetic fields irrigation system requires more detailed analysis. Between UMass, Amherst College, and Hampshire College, approximately 616,000 gallons per day (gpd) is used for irrigation during the summer. The operators of each irrigation system are in close communication to schedule irrigation during off peak-hours, reduce the rate of withdrawal, and minimize the volume of water used. Alternative water sources for irrigation have been discussed. These options include private wells, surface water withdrawal, municipal supply with storage tanks, and water reuse. The DPW is currently looking at future water reuse for irrigation at the cooling tower.

Limits of Service

The Town of Amherst's water system has a hydraulic gradeline (HGL) of 471 ft. (United States Geological Survey (USGS) datum). This is based on the overflow elevation of the Town's tanks and establishes the pressure gradients in the Town. Based on this elevation, the topographical service elevations in the Town can be estimated.

In general, a water system should provide a pressure of approximately 35 to 45 pounds per square inch (psi) as a minimum under normal domestic peak hour flows, and by law, must maintain 20 psi under all flow conditions. The Facility Plan Update estimated the lowest usable water level in the tanks at 430 ft. Based on these figures, and providing for headlosses in the system, the highest elevation that the water system can serve, without additional pumping, is estimated at approxmiately 350 to 360 feet. The areas above this elevation include:

- East of Henry Street (Flat Hills, Mt. Boreas and Shutesbury Road);
- North of East Leverett Road;
- South of Bay Road; and
- Pelham Road.

Water service to these areas will require a booster pumping system and possibly additional storage.

Wastewater Collection and Treatment

Wastewater Collection

The existing system consists of approximately 75 miles of gravity sewer and force mains ranging in sizes from 4" to 36". There are twenty-one pump stations in the system to transport sewage due to the Town's topography. Vitrified clay pipe is estimated to comprise slightly less than half of the sewers' make-up. The remaining pipe is primarily transite. Approximately 93 percent of the Town's population is connected to the sewer system.

The wastewater collection system was designed with expansion capacity. The ability of the existing system to support expansion to the 12 unsewered sub-areas was evaluated in the Sewer Extension Master Plan. The plan conceptually determined the most feasible method of connecting these areas to the existing sewer system, including the need for pumping low-pressure sewers and for downstream capacity upgrades required in the existing system. Sub-areas 8 and 9 (High Point Drive and Market Hill Road) would require downstream sewer improvements.

In addition, the potential for localized community-based treatment and/or subsurface disposal systems were investigated for these areas. However, costs and regulatory issues may make this alternative less feasible than connecting to the existing system.

Wastewater Treatment

The wastewater treatment facility is a secondary treatment facility, located along the Mill River in Hadley, directly behind the University of Massachusetts athletic fields. The wastewater is brought to the plant by gravity sewers from UMass, North Amherst, and central and southern Amherst. The influent passes through three parshal flumes to preliminary treatment by two comminuters, two grit collectors, and three primary sedimentation tanks. The secondary treatment consists of three aeration tanks. Sludge and septage disposal processes follow. Sludge is thickened on-site and then disposed of at an off-site EPA approved sludge incinerator, under a disposal agreement with Casella Waste Management. The treated effluent is disinfected and discharged into the Connecticut River.

Septage (from septic tanks) is received and treated from Amherst, Pelham, and Shutesbury. Typically the plant receives approximately 200,000 to 250,000 gallons per year.

Infiltration/Inflow

Infiltration and inflow (I/I) is the occurrence of groundwater and stormwater entering the sewer system by means of illegal connections, cracks and leaks. It is important to reduce the amount of extraneous flow for various reasons. Sewer pipes are sized to carry a projected amount of sewage flow. In an older sewer system such as Amherst's, groundwater infiltrate and stormwater inflow can enter into the sewer system and can greatly increase

the flow during a rain event. Existing sewer pipes that do not have the design capacity to handle the additional flow can overflow or surcharge. The same holds true for the pumping stations that were designed with a specific capacity.

Sewer Extension Plan

In 2004 the Town completed a Sewer Extension Master Plan. The plan addressed twelve sub areas in the Town that do not currently have sewer service and may have a need to connect to the Town system.

Each sub area was evaluated according to existing on-site disposal problems, homeowner desire, soil limitations, environmental criteria, and constructability. The evaluation concluded that the following sub areas have moderate need or minor need for sewer:

Moderate Need:

- *Harkness Road Area:* 4,900 feet of 8-inch gravity sewer;
- *Southeast Street Area:* 6,800 feet of 8-inch gravity sewer;
- *Hulst Road Area:* 11,700 feet of 8-inch gravity sewer, 5,300 feet of 6-inch force main, 1,000 feet of 2-inch low pressure sewer, one pumping station; and
- *Wildflower Drive Area:* Public Development-13,200 feet of 8-inch gravity sewer, 2,100 feet of 4-inch force main, 3,700 feet of 1-1/2 and 2-inch of low pressure sewer, one pumping station. Private Development – 10,600 feet of 8-inch gravity sewer, 2,500 feet of 5-inch force main.

Minor Need:

- *Southeast Street*: 6,800 feet of 8-inch gravity sewer;
- *Shays Street*: 4,000 feet of 8-inch gravity sewer and 2,500 feet of 2-inch low-pressure sewer; and
- *Montague Road*: 6,000 feet of 8-inch gravity sewer and 300 feet of 4-inch force main.

The estimated wastewater flows for the above sewer needs areas are shown in Table 8.6.

Table 8.6: Estimated Wastewater Flows

Subarea	Average (gpd)	Peak Hour (gpd)
Harkness Road Area Sewers	10,400	41,900
Southeast Street Area Sewers	15,900	64,300
Hulst Road Area Sewers	36,300	146,500
Wildflower Drive Area Sewers	76,200	308,000
Shays Street Area Sewers	10,700	43,300
High Point Drive Area Sewers	32,200	130,000
Montague Road Area Sewers	14,800	59,800
Total	196,500	793,700

Source: 2004 Draft Sewer Extension Master Plan

Recent Projects

In the past few years, two new sewer projects have been constructed, one for the Middle Street Area, and the other for Chapel Road/Mechanic Street. These areas were identified as having "Significant" or "Major Need" of wastewater management systems in the 1991 Wastewater Facilities Plan.

According the 2004 Draft Sewer Extension Plan, the Middle Street Area was completed on July of 2003. The sewer system includes two pumping stations, approximately 9,800 feet of 8-inch and 2,200 feet of 10-inch diameter gravity sewer, and 1,300 feet of 2-inch and 1-1/2-in diameter pressure sewer. Chapel Road/Mechanic Street Sewer project had expected completion in 2005, including 4,000 feet of 8-inch and 10-inch diameter gravity sewer and 2,400 feet of 6-inch force main. Other recent improvements include:

Treatment Plant Improvements:

- Heat Pump – Three heat pumps were installed at the treatment plant to recover heat from treated wastewater. The units were installed from an energy conservation grant from Northeast Utilities and provide building heat for three areas of the facility.
- Pumping Station Controls – Six Smith and Loveless pump stations were updated with new controls installed by treatment plant staff.
- Plant Water System – Plant employees completely refurbished the plant water system to serve the treatment plant and provide treated effluent to the University of Massachusetts power plant.

Miscellaneous Sewer Projects:

The following rehabilitation of sewer lines were completed per Bid documents as prepared by Camp, Dresser and McKee, the Town's wastewater consultant:

Sunset Court	Orchard Street
McClure Street	Gaylord Street
Red Gate Lane	Hills Road

Stormwater and Drainage

Existing Conditions

The Amherst Department of Public Works (DPW) constructs drainage structures and pipes as required with the construction of new roads and sidewalks, and corrects problems as they occur. There is no prioritized capital improvement plan for stormwater systems.

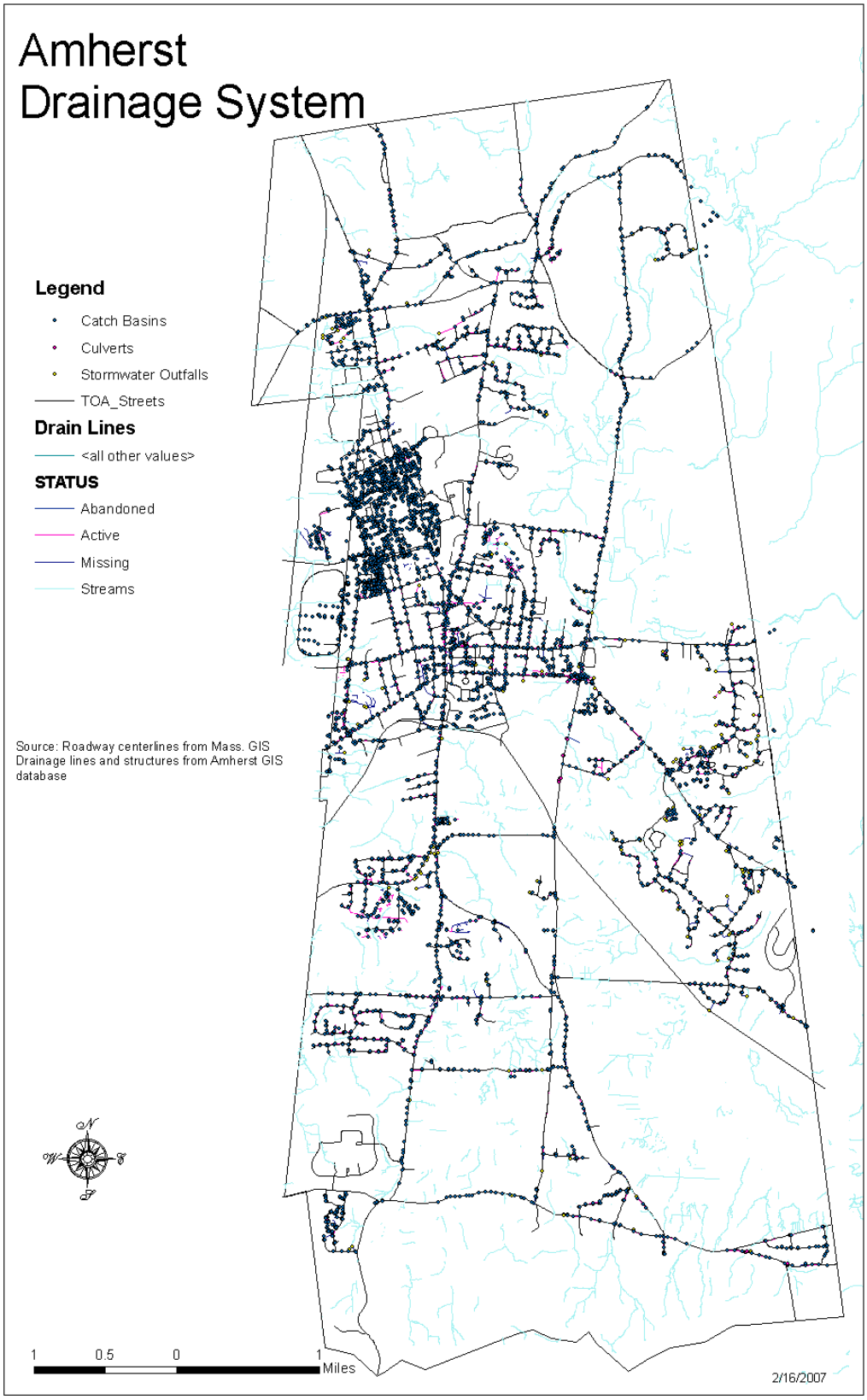
The Town drainage system is currently shown on the Town GIS system (see figure 8.1). It consists of localized systems including catch basins, manholes, pipes, culverts, drainage ditches and outfalls. Generally, the more recent developments (within the past 10 years) have stormwater collection and disposal systems that must provide treatment to remove pollutants and recharge of groundwater. These systems include stormwater treatment package units, grass swales, detention swales and ponds and infiltration structures. These systems are regulated by the Town Planning Board with review by the Town Engineer and Conservation Commission. The requirements for stormwater management are detailed in the Massachusetts Stormwater Policy Handbook. The older drainage systems in the Town may or may not comply with the standards set forth in the policy.

The DPW-Highway Division is responsible for maintaining the drainage system and structures. This involves:

- Cleaning catch basins (800 per year)
- Street sweeping (270 miles per year)
- Drainage ditch cleaning (4 miles per year)
- Installation of new drainage piping and catch basins.

The EPA Phase II Stormwater Rule regulates municipal stormwater run-off from certain small municipal systems. Amherst was not identified in this requirement. However, the DPW has identified compliance with this regulation as a long term goal.

FIGURE 8.1: AMHERST DRAINAGE SYSTEM



Source: Town of Amherst G.I.S

Recent Projects

The following improvements to the stormwater and drainage system have occurred in recent years:

- 2002 – Drainage repairs in Groff Park
- 2004 – Existing storm pipe was replaced on South East Street and Elm Street. Five existing culverts were replaced on East Leverett Road
- 2005 – College Street and Main & Lessey Street sidewalk projects have included construction of drain pipe and drainage structures.

Street Lights

Existing Conditions

The Town of Amherst, through the DPW-Electrical Division, operates and maintains 1,119 street lights. The street lighting system was acquired from Western Mass Electric Co. in 2001. The Town has a street light inventory with many of the lamps outdated and inefficient. Some lamps are over 30 years old. Approximately 20 percent of the lamps have been updated, primarily as reactive maintenance when lamps burn out.

The DPW also maintains six school zone light systems and 14 traffic signal lights.

Recent Projects

The DPW's goals for street lighting are:

- To modernize and upgrade all street lights with energy efficient, "dark sky" fixtures;
- To test Light Emitting Diode (LED) technology; and
- To modernize all traffic signals and make them handicapped accessible.

In general, the DPW proposed modernizing all of the street lights within a five year period. The DPW is also developing street light and traffic light technical standards for the Town. The most recent street light projects have been implemented as the result of new sidewalk construction. The projects in 2005 are as follows:

- Main & Lessey Street – Seven new street lights
- Pleasant Way – Seven new street lights
- Boltwood Sidewalk – Six new street lights

Capacity for Future Growth

Overview

Amherst's utilities provide water, wastewater disposal, stormwater management, and street lighting throughout a majority of the Town. The basic infrastructure has the capacity to provide for growth within the Town, while the Town Zoning and Planning Board requirements provide design

standards to meet current regulations and minimize impacts on the existing infrastructure. The capacity of the linear infrastructure (pipes and pumps) is dependent upon the specific areas of the Town, the type of growth, and the flow requirements. Depending upon these factors, localized infrastructure improvements may be required.

Water Supply Capacity

The 2001 Water Supply & Distribution System Facility Plan Update projected future water demands as shown in Table 8.7.

Table 8.7: Recommended Water Consumption Planning Projections

Fiscal Year	Average Day (MGD)		
	Supply Planning	Immediate Implementation	Conservation Goal
1996 - 2000	-	3.79	-
2010	4.47	3.90	3.33
2020	4.62	4.04	3.45
Fiscal Year	Maximum Day (MGD)		
	Supply Planning	Immediate Implementation	Conservation Goal
1996-2000	-	5.11(2)	-
2010	6.26	5.46	4.66
2020	6.47(1)	5.66	4.83(3)

(1) Used for long-term capacity planning.
(2) Used for immediate implementation capacity planning.
(3) Used for water conservation/wise use policy planning.

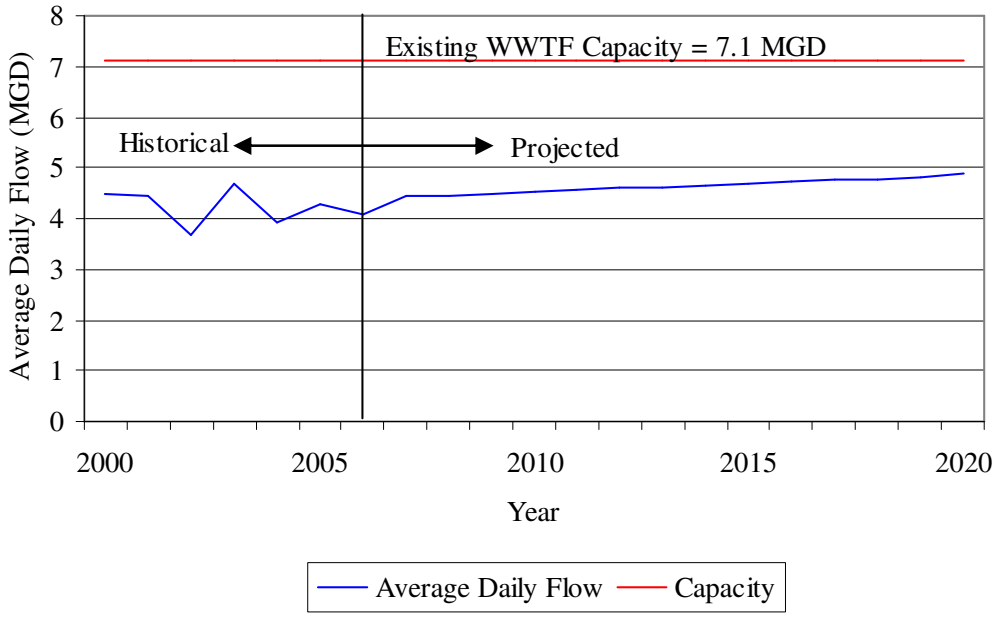
The report also identified the supply yield as 6.64 mgd and a "reliable" yield (largest supply out of service) to be 4.34 mgd. Based on the available yield and the water projections, there is sufficient total capacity to meet future demands; however, without the largest supply in service, the supplies cannot meet anticipated maximum day demands. Therefore, either additional supplies are required or water conservation and reuse must be implemented.

Sewer Capacity

According to the 2004 Draft Sewer Extension Master Plan, the existing sewers in the Town of Amherst were designed to have capacity for future development. The 1991 CDM Wastewater Facilities Master Plan identifies the need for relief at the existing East Pleasant St. sewers due to capacity problems.

The historical data of the average daily flows of the wastewater treatment plant including projected wastewater usage is graphed in Chart 8.8. The projection is based on the projected population in 2020 in addition to estimated flows calculated by the 2004 Sewer Extension Master Plan.

CHART 8.8: WASTEWATER TREATMENT PLANT AVERAGE DAILY FLOW



Sources: Town of Amherst, 2004 Sewer Extension Master Plan, CDM

No trend is evident as the average daily flow flucuates year to year. This is most likely due to the rainfall events of a particular year and the resulting infiltration/inflow. According to projected flows, the Amherst Wastewater Treatment Facility has sufficient capacity to treat future flows.

School System

The Amherst Regional Public Schools provides education and special education services for students in pre-kindergarten through the twelfth grade. The school system thrives on the diversity of its 4,000 plus student population, including native speakers of over 25 languages. The school system consists of the following three districts – Amherst, Pelham, and Regional School Districts. The Amherst District serves students of Amherst in four community elementary schools (Crocker Farm, Fort River, Mark's Meadows, and Wildwood) and the Pelham District serves the students of Pelham at one elementary school. The Regional District serves the students of Amherst and Pelham, as well as Leverett and Shutesbury in one middle school (grades 7-8) and one high school (grades 9 – 12). The school system offers comprehensive academic programs to its students.

The districts office is located in the middle school at 170 Chestnut Street. Table 8.8 provides a listing of these facilities (excluding the Pelham Elementary School) along with their most recent enrollment and staffing levels and approximate capacity level.

Table 8.8: Amherst Schools Educational Facilities: School Year 2006

Facility	Grades	Enrollment	Staff	Current Capacity Level
Crocker Farm Elem. School	Pre-k -6	367	94	Above Capacity
Fort River Elem. School	K-6	476	85	Above Capacity
Marks Meadow Elem. School	K-6	180	46	Above Capacity
Wildwood Elem. School	K-6	437	103	At Capacity
Amherst Regional Middle School (ARMS)	7-8	557	116	At Capacity
Amherst Regional High School (ARHS)	9-12	1320	201	At Capacity

Source: New England School Development Council- Draft Demography and Enrollment Projections April, 2007

Historical enrollment figures at the elementary schools displays a declining trend with a student population of 1,732 in the year 1997 to a population of 1,460 in the year 2007.

Due to the transient population of Amherst with the Town's Colleges and University, it is difficult to make an accurate prediction of future enrollment at the schools based on passed trends. This poses the greatest difficulty at Marks Meadow, which is located on and owned by the University of Massachusetts campus.

Existing Conditions

Mark's Meadow- Mark's Meadow Elementary school contains students K-6, located at 813 North Pleasant Street on the University of Massachusetts Amherst campus. The facility was built in 1958 with no known recent renovations. It initially served as a laboratory school for the School of Education at the University to observe the children, but it is no longer in use. The buildings square footage is 40,700 with 9 interchangeable classrooms and 1 kindergarten classroom.

The building is considered safe but is in need of major renovations. The students currently eat in classrooms due to the absence of a cafeteria. Asbestos is present in the observation corridor, ceiling of auditorium, in the basement, and under the carpet. Leaks in the ceiling create the issue of mold. The building has inadequate air exchange and the existing heating and ventilation system is in poor condition

Expansion to the existing building is limited due to its location and ownership by the University. Future plans include finding a new school site.

Wildwood- Wildwood Elementary School educates children K-6 and is located at 75 Strong Street, on a 14.34 acre site. The 108,000 square foot building contains 20 interchangeable classrooms and 3 kindergarten classrooms. The building was original constructed in the 1970's as a single story elementary school with an open classroom design, referred to as "quads." The "quads" were later divided into four separate classrooms using partitions that extend from the floor to one foot below the ceiling. These

partitions create poor ventilation and classroom disruption due to noise levels and traffic patterns. Other health issues include mold growth, lack of hot water in parts of the building, and unit ventilators located at ground level that increase the intake of mold, pollen, dirt, leaves, insects and vehicle fumes from the outdoors.

The floor plan of the school is as such that visitors pass through unsupervised hallways and classrooms before reaching the main office to sign in. This poses as a security issue that should be addressed. The school grounds also require work, including repaving to the wheelchair walkways and driveways.

Fort River School and East St. Annex- Fort River School is located at 70 South East Street on an 11.46 acre site. The facility is 108,000 square feet with 19 interchangeable classrooms and 3 kindergarten classrooms. Similar to Wildwood, the facility was constructed in 1973 as a single story elementary school with an open classroom design. Partitions were added to separate the "quads" into three to four separate classrooms. Due to the similar layout as Wildwood, Fort River's deficiencies are identical to that of Wildwood.

The East St. Annex is located across from the Fort River School. The building was constructed in the early 1900's as a two-story building. It was rebuilt in 1937 after a fire had destroyed the original structure. The current building is approximately 9,600 square feet with eight rooms on three levels. It was used as an annex to the Fort River School up until five years ago. It is now used for special educational programs. The building requires renovations to become ADA compliant.

Crocker Farm School- The Crocker Farm School contains students from pre-kindergarten through the 6th grade. The school is located at 280 West Street. It was originally constructed in 1966 as a single story elementary school. In 2002, major renovations were made to the school. The building has a square footage of 90,800 with 18 interchangeable classrooms, 3 kindergarten classrooms and 4 pre-k classrooms.

The physical condition of the building is above satisfactory due to recent renovations. The main issues of concern include capacity requirements, storage space, and HVAC issues.

Amherst Regional Middle School – The Amherst Regional Middle School is located at 170 Chestnut Street. The building is approximately 200,000 square feet and sits on 8 acres of land. The facility was last renovated in 2000 and is in generally moderate condition with a few building systems that may require attention, such as the exterior windows. The school houses the central offices for technology, facilities maintenance, transportation, human resources, and the superintendent office. The facility also holds a majority of community summer programs on their grounds and

the auditorium is utilized for many public meetings. As a result, there is constant traffic flow at the school.

Amherst Regional High School – The Amherst Regional High School is located at 21 Mattoon Street on a 12 acre site. It consists of two buildings, the main building, grossing approximately 240,000 square feet, and the South Amherst Campus building, approximately 2,500 square feet. The South Amherst Campus is a four classroom building that provides services to children with special learning needs. The main building is newly renovated with a new roof. The majority of the building is in good condition however, the gymnasium requires demolition and renovation. The site requires additional parking spaces and the confined setting of the site causes security concerns. The entire property experiences use with shared athletic fields with the Town.

Sustainable Solutions

As a collective, the district is interested in considering the following techniques when renovated the school buildings:

- Sustainable flooring materials;
- Solar powered walkway lighting;
- Dual energy source steam boilers;
- Sky lights for natural light in class rooms and hallways;
- Dual action toilet conversions;
- Solar power for energy use; and
- Geothermal heat recovery.

Public Safety

FIRE DEPARTMENT

A *Fire Station Site and Building Assessment Work Study (Caalo & Bieniek Associates, Inc.)* has been prepared for the Amherst Fire Station Study Committee that evaluates the existing fire station headquarters and identifies new locations and possible scenarios for a new sub fire station. This report was utilized to develop the existing conditions of the Amherst Fire Department.

Fire protection and emergency services for the Town of Amherst are provided by two existing facilities. The fire station headquarters building is located in the center of Amherst and a sub station is located in the northern part of the Town, in close proximity to the UMass campus. Each station is equipped for fire rescue, EMS (emergency medical services) and fire prevention to Amherst as well as the neighboring communities of Hadley, Pelham, Leverett and Shutesbury.

General

Fire protection and emergency personnel for both facilities includes three different forces, “career,” “call,” and student fire fighters. “Career” fire

fighters are full-time and on duty 24 hours a day. All are certified as EMT-intermediates or higher and many are paramedics. The "call" force is comprised of part-time firefighters who work or live in the Amherst area. They are on-call 24 hours a day to respond to the station when there is a working fire or when the career firefighters are responding to multiple emergencies. The student force is comprised of students from the local colleges that serve as volunteer fire fighters while attending school. They are also on call 24 hours a day, and during the school year they staff their engine every week night and all day on weekends. The following list is the current staffing at the Central and North Fire Stations (source: *Fire Station Site and Building Assessment Work Study*).

1 Chief
2 Assistant Chiefs
1 Fire Prevention Officer
8 Captains
32 Career Fire Fighters
1 Business Officer
1 Chaplin (part of call force)
22 Call Force Fire Fighters
36 Volunteer Fire Fighters

A total of 28 major equipment (vehicles, etc) are currently in use by the both the north and central stations. Table 8.10 provides the summary below.

Table 8.10. Fire Department Equipment

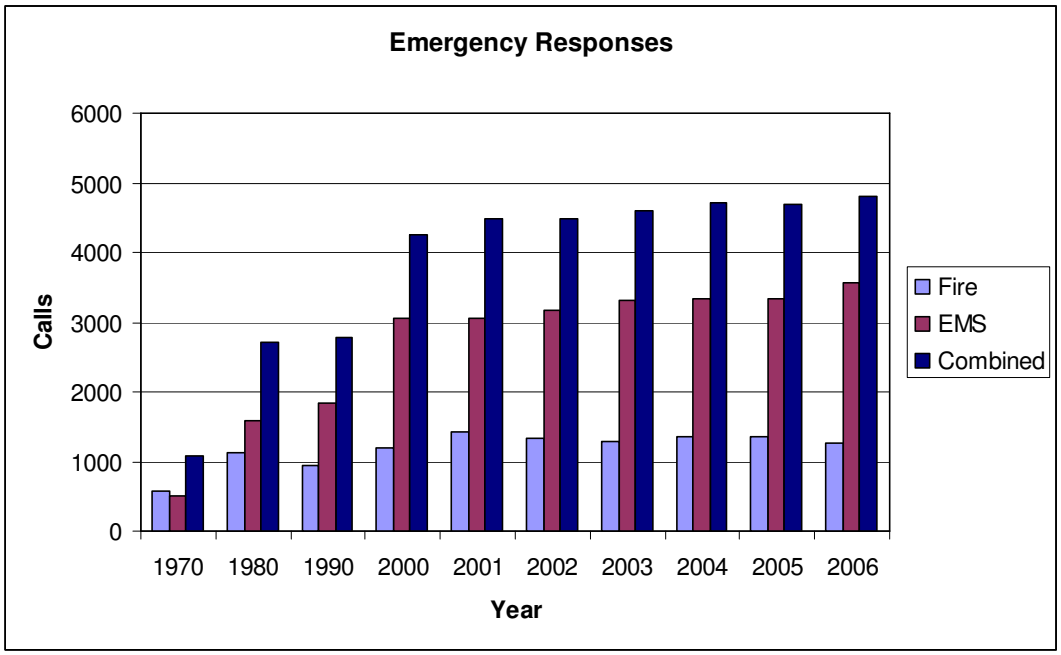
Vehicle	North Station	Central Station	Total
Pumper	4	2	6
Ambulance	3	2	5
Aerial Ladder Apparatus	1	-	1
Heavy Rescue	-	1	1
Fire Prevention Car	-	1	1
Officer Car	1	1	2
Truck/Trailer	9	-	9
Van	1	-	1
Boat	1	-	1
Tanker	1	-	1

Source: Caolo & Bieniek Associates, INC. Fire Station Site & Building Assessment Work

Response Time

NFPA guidelines require the following:

- First two pumper apparatus be located with 1.5 miles of the central business district;
- Ladder apparatus are required to be located within 2.5 miles of a central business district;
- Pumper apparatus response time is to be 6 minutes or less; and
- Ambulance to cardiac arrest of anaphylactic shock response time is 4 minutes.



Source: Caolo & Bieniek Associates, INC. Fire Station Site & Building Assessment Work

Facilities

The Central Amherst Fire Station is located in downtown Amherst at 68 North Pleasant Street. The headquarters was originally constructed in 1929, with a one story garage later constructed at the rear of the building. In addition to the three bay configuration, the structure also contains office space for the Chief/Assistant Chief and administrative staff. The structure is located on two parcels that total 0.2 acres.

The North Station is located at the intersection of 601 East Pleasant, in close proximity to the University of Massachusetts campus. It is a modern sub station which houses the student force. The structure has sufficient capacity for staff and apparatus and currently houses overflow material of the department.

POLICE SERVICES

Amherst's police services are administered from the police station located at 111 Main Street in downtown. The three floor brick facility houses the following police operations:

- Administration
- Animal welfare
- Public safety
- Communications – Comprised of a unit of dispatch for police, fire and EMS
- Detective bureau- Responsible for follow-up investigations, self-initiated crime prevention, support for the patrol force
- Parking management
- Records bureau

Overall, the police building is in good condition, however, it has met its capacity. Available funds and site space to expand the existing police station are scarce. Parking spaces are also an issue.

From a personnel standpoint, additional funding is required to maintain and increase the current staffing conditions.

Libraries

Amherst's first public libraries were organized in the late 1800's, as individual establishments. In 1972, Jones Library, North Amherst and Munson Memorial Library were combined as one system. Jones Library is the largest of the three, but each library maintains a plethora of books, audio and visual materials, reference materials, and activities for children. The Amherst Town Libraries are among the busiest libraries in Western Massachusetts, second to the Springfield City Library System.

Jones Library

The Jones Library is located at 43 Amity Street in downtown Amherst. Samuel Minot Jones, for whom the library is named, donated a large sum of funds to Amherst in 1921 towards construction of the facility, completed in 1928. At that time, the three story building included an art studio, study rooms, a children's wing, and a grand piano room. The library was renovated in 1990, adding 50,000 square feet to the facility and in turn doubling the service levels.

Currently, the library offers up to date circulating collections for both children and adults, professional information assistance, open seven days a week, free wireless internet and volunteer tutors providing instruction at the English as a second language center.

Munson Memorial

The Munson Memorial Library is located at 1046 Southeast Street. The facility was built on land that was donated by Mr. William Atkins and has been in service since 1930. The facility maintains over 18,000 books, tapes, videos, CD's, magazines, books on tape and reference materials. The library also holds a special program of story hour for preschoolers.

North Amherst Library

The North Amherst Library is located at 8 Montague Road. The North Amherst Library Association founded it in 1869, where it kept its records at the post office. In 1883, it was moved to a school house. The existing library building was constructed in 1893, and was renovated in 1997. Similar to the Munson Memorial library, the facility maintains over 18,000 books, tapes, videos, CD's, magazines, books on tape and reference materials.

Needs Assessment

A Long Range Plan for Amherst Town Libraries 2007-2010, prepared by the Library director, identifies current weakness and threats of the library system.

Weakness – Not enough staff, lack of communication among the departments, insufficient parking, lack of space for computers, high turnover in staff in some departments, HVAC systems, funds for equipment and supplies

Threats – Unstable patrons and lack of security force, no time to learn new skills and keep current with technology, local and state budgets cuts, lack of funding, reduction in operation hours.

Town Services

Town Hall

The Amherst Town Hall is a three floor brick faced building, located at 4 Boltwood Avenue in downtown Amherst. The building was constructed in 1889 with a Romanesque style. The historic appeal is one that Town plans to upkeep. The building houses many of the Town's departments and services. These are listed below along with their respective mission statements.

Accounting – Mission: To further the mission of the Finance Department through maintenance of appropriate records and financial reports and through monitoring of all financial activity for accountability and legal compliance.

Assessors –Mission: To further the mission of the Finance Department through the fair and equitable distribution of property taxes. To maintain an open process that makes information available to citizens and professionals in a timely and efficient manner.

Collector – Mission: To further the mission of the Finance Department through timely, accurate billing and collection of revenue. To provide courteous, comprehensive service to citizens seeking information or assistance.

Conservation – Mission: The Conservation Department is responsible for the administration of environmental laws and policies, open space protection and management, water management, preservation of natural features of the environment, and coordination for joint action with many town bodies.

Finance/Treasurer – Mission: **Finance:** To further the mission of the Finance Department through the development and coordination of policies and processes that identify, evaluate, develop and facilitate the efficient allocation of resources. **Treasurer:** To further the mission of the Finance Department through effective investment and management of Town funds and through the effective use of debt financing where appropriate.

Human Resources – Mission: To manage the human resources cycle (from recruitment to retirement) in a manner that assures a

competent, diverse work force capable of providing quality services to the community.

Information technology – Mission: To select, implement, maintain and support all things technology related including wired and wireless telephony systems, security and video systems, software and database systems, message and collaboration systems, geographic information systems, websites and public access systems, computers and server systems and wired and wireless network infrastructure systems; to meet the ever-increasing citizen expectation for a more open and digitally accessible government, and to meet the individualized service objectives of all departments, boards and committees.

Inspection Services – Mission: To ensure the public health, safety, and welfare of the inhabitants of the Town of Amherst by administering the General Laws of the Commonwealth of Massachusetts and Town of Amherst bylaws as they relate to land use and the construction and occupancy of building and structures.

Planning – Mission: To protect and enhance the environmental, economic and social quality of life in Amherst, for its residents and visitors, by creating and implementing appropriate planning initiatives and regulatory mechanisms for the preservation and protection of the Town.

Town Clerk – Mission: To record and preserve the Town's vital and permanent records in accordance with state statutes and to provide quality public service and accessibility to public records. To ensure compliance with state mandated licensing and filing.

Town Manager – Mission: To fulfill the Select Board's role and responsibility as the chief elected officials responsible to the citizens of Amherst for policies and for the administration of the Town government. To provide leadership for, support to and coordination of Town employees and hundreds of citizens involved in considering various forms of information and in making recommendations and decisions about policies and priorities for Town services. To supervise and assist Town employees in implementing decisions and providing Town services in an effective manner.

Bangs Community Center

The Bangs Community Center is a brick structure located at 170 Boltwood Avenue that houses a number of services to the community. These services are listed below.

Community Services – Provides a variety of services to the Amherst community. These services include childcare/early education information, tuition assistance for low income families, administering Town appropriations to human service agencies,

providing emergency assistance to low income individuals and family, assessing community needs with respect to childcare and human services, developing programs that respond to community priorities, and working collaboratively with a number of committees and groups that provide important services to the community

Health – Houses both the Board of Health and Health Department, which both have very important and different roles. The Board of Health is responsible for making health policies, creating new policies, holding public hearings on existing policies, and holds hearings on variances and requests of existing policies. The Health Department is responsible for implementing the policies of the Board, including inspections and fines.

Human Rights – Mission: to promote justice and equal protection under the law for all citizens through education, mediation, and enforcement of local, state and federal civil rights policies and laws.

Maintenance – Mission: Maintain a healthy, clean, safe and efficient environment for conducting Town business and other public activities through building operation and preventative maintenance programs that also serve to preserve and extend the life of the Town's physical assets.

Senior Center – Amherst was voted by Money Magazine as one of the top ten places to retire in the country. This speaks volumes to the operations of the Senior Center. The senior center offers hot lunches Mondays- Fridays, which is a great chance to socialize and eat a healthy meal. There is also a Meals on Wheels program that delivers meals prepared by the UMass Dining Commons at dinner time. Other services include consultations for housing needs, Medicare, Medicaid, prescription insurance, and medi-gap insurance. The magazine "Senior Spirit" is sent to residents over 59 at no cost. The magazine provides details and schedules for a number of social events and information on health clinics and care.

Veterans Service – Mission: Provide Amherst veterans quality support services, to administer an emergency financial assistance program for those veterans and their dependents who are in need.

Public Works Building

The Public Works Building is a brick facility located at 586 South Pleasant Street. It is responsible for all of the Town's infrastructure maintenance and construction. The department includes the following eight operational divisions:

- **Highways** – Addresses roadway, street and sidewalk repairs in order to maintain safe and reliable travel ways;
- **Water** – Maintains the water sources, water treatment plants and distribution system to serve quality water to its customers;

- **Wastewater** – Maintains proper operation of the wastewater treatment plant;
- **Street Lights & Traffic Signals** – Ensures proper operation of the street and traffic lights for the safety of the residents;
- **Parks & Commons** – Maintains the softball, baseball, football, lacrosse, soccer and multi-purpose recreational fields in Town;
- **Tree Care** – Removes and plants a variety of tree breeds as required;
- **Sewer Maintenance** – Investigates sanitary sewer complaints and corrects problems found in the sewer system; and
- **Recycling & Solid Waste** – Operates the solid waste transfer and recycling facility and promotes programs to reduce landfill waste and increase recycling.

The following two are support divisions:

- **Administration & Engineering** – Works with the departments to maintain safety of public travel ways and minimize the cost of major reconstruction; and
- **Vehicle Maintenance –** Maintains the utility vehicles utilized by the department.

Utility Master Plan Considerations

In the past, public utilities have been designed and operated as individual entities instead of interrelated operations. Massachusetts regulations now require water, wastewater, and stormwater utilities to look at integrated, basin wide issues. These regulations include the Water Management Act, Massachusetts Stormwater Policy, and Massachusetts Water Policy. They focus on:

- Community wide water budgets;
- Water Conservation;
- Performance standards and mitigation;
- Wastewater reuse; and
- Stormwater recharge.

Within the policy, there are specific recommendations to implement these concepts. For the Town of Amherst, many of these concepts are currently being implemented. The Town should continue to practice Integrated Water Resource Management (IWRM) in the following areas:

- Water conservation and leak detection;
- Wastewater reuse for irrigation of athletic fields and power plant;
- Implementing a Stormwater Management Plan and water quality Best Management Practices (BMPs);
- Reducing inflow/infiltration in the wastewater collection system; and
- Watershed and aquifer land acquisition.